

stepping up the voltage of the DC power supply using a DC-DC converter to produce a differential voltage between the target boosted voltage and the voltage of the DC power supply; and

producing the boosted voltage by adding the differential voltage to the voltage of the DC power supply.

6. (Amended) A power converting apparatus for generating a predetermined boosted voltage, comprising:

a DC power supply; and

a step-up DC-DC converter, connected to the DC power supply for producing a differential voltage between the predetermined boosted voltage and a voltage of the DC power supply, wherein the predetermined boosted voltage is provided as a sum of the voltage of the DC power supply and the differential voltage.

7. (Amended) A power converting method of supplying a first output voltage substantially equal to a voltage of a main battery and a second output voltage lower than the voltage of the main battery, comprising the steps of:

forming the main battery by connecting a first battery for generating the same voltage as the second output voltage in series to a second battery for generating a voltage corresponding to a difference between the first output voltage and the voltage of the first battery;

producing the first output voltage by adding the voltages of the first and second batteries;

connecting a charge power supply for generating a voltage lower than the voltage of the main battery to a step-up DC-DC converter;

stepping up the voltage of the charge power supply using the step-up DC-DC converter to produce a differential voltage between the voltage of the main battery and the voltage of the charge power supply; and

charging the main battery with a sum of the differential voltage and the voltage of the charge power supply.

REPLY UNDER 37 C.F.R. § 1.111***Status of the Application***

Upon entry of the amendment, claims 1-9 and 11-16 are pending and stand rejected. Claims 10 and 17-18 have been removed from consideration by the Examiner pursuant to 37 C.F.R. § 1.142(b). No new matter has been added to the present application.

In view of the foregoing amendments and the following remarks, Applicants respectfully request reconsideration of the present application and a Notice of Allowance.

Anticipation Rejection – 35 U.S.C. § 102(b)

Claims 1-9 and 11-16 stand rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent No. 5,528,122 (hereinafter “Sullivan”). Applicants respectfully traverse the rejection and request reconsideration because Sullivan fails to teach every element of the recited claims.

Applicants note that Sullivan is directed to a circuit that equalizes the voltages of batteries 120 and 124. Referring to Figs. 3 and 4 of Sullivan, a 12 V load 24 is connected to a lower grounded battery 124 and a 24 V load 22 is connected to batteries 120 and 124. When Field-Effect Transistors (FETs) 108 and 104 are turned on and FETs 102 and 106 are turned off, the voltage of battery 120 is applied to windings of autotransformer 114 between terminal 112 and center tap 214 (*see* Fig. 4) and the voltage of battery 124 is applied to the windings of autotransformer 114 between terminal 110 and center tap 214. In contrast, when FETs 102 and 106 are turned on and FETs 104 and 108 are turned off, the voltage of battery 120 is applied to the windings of the autotransformer 114 between terminal 110 and center tap 214 and the voltage of battery 124 is applied to the windings of autotransformer 114 between terminal 112 and center tap 214. Accordingly, autotransformer 114 can be connected to both batteries 120 and 124 *only* when the voltages of batteries 120 and 124 are equalized and the ratio of the winding number between terminals 112 and 214 to the winding number between terminals 110 and 214 is 1:1. Therefore, Sullivan can be applied only to a system including two batteries that are connected in a series and *where each generates the same voltage*.

Applicants respectfully submit that Sullivan fails to disclose all of the limitations of claim 1. Claim 1 claims a method of supplying power and recites “*stepping down* the voltage

output from the second DC power supply to produce the second output voltage by using the DC-DC converter.” For example, DC-DC converter 5 shown in Figs. 1 and 2 generates the second output voltage (12V) by *stepping down* the voltage (24V) of the second DC power supply 1b. Therefore, the second output voltage is *lower* than the voltage of the second DC power supply. Unlike the present invention, the voltages of batteries 120 and 124 of Sullivan are *equal* (12V). Therefore, the Sullivan reference does not disclose “stepping down the voltage output from the second DC power supply to produce the second output voltage by using the DC-DC converter” because there is no need to convert the voltage (12V) from the upper battery 120 (second DC power supply) to the second output voltage (12V). Because Sullivan does not disclose all the limitations of claim 1, Applicants respectfully submit that Sullivan does not anticipate claim 1.

Applicants respectfully submit that Sullivan fails to disclose all of the limitations of claims 2 and 11. Claims 2 and 11 claim a power converting apparatus and recite “a DC-DC converter, connected to the second power supply, for converting the voltage from the second DC power supply to the second output voltage.” Because the DC-DC converter converts the voltage (24V) of the second DC power supply 1b to the second output voltage (12V), the second output voltage is *not equal* to the voltage of the second DC power supply 1b. In contrast, Sullivan does not disclose the claimed DC-DC converter. Also, in Sullivan the voltages of the upper battery and the lower battery 124 are equal, so there is no need to convert the voltage (12V) from upper battery 120 to the second output voltage (12V). Because Sullivan does not disclose all the limitations of claims 2 and 11, Applicants respectfully submit that Sullivan does not anticipate claims 2 and 11.

In light of the foregoing amendments, Applicants respectfully submit that the Examiner’s rejection of claims 5-7 is moot because Sullivan does not disclose all of the limitations of newly-amended claims 5-7. Claim 5 recites “stepping up the voltage [12V] of the DC power supply [10] using a DC-DC converter [10] to produce a differential voltage [24V] between the target boosted voltage [36V] and the voltage of the DC power supply.” Similarly, claim 7 recites “stepping up the voltage [12V] of the charge power supply [10] using the step-up DC-DC converter [5] to produce a differential voltage [24V] between the voltage [36V] of the mail battery [1] and the voltage [12V] of the charge power supply.” Claim 6 recites “a step-up DC-DC converter, connected to the DC power supply, for producing a differential voltage between the predetermined boosted voltage and a voltage of

the DC power supply.” Sullivan fails to disclose the claimed stepping up of the voltage of the DC power supply by using a step-up DC-DC converter. Because Sullivan does not disclose all the limitations of claims 5-7, Applicants respectfully submit that Sullivan does not anticipate claims 5-7.

Applicants respectfully submit that Sullivan fails to disclose all of the limitations of claim 8. The power converting apparatus of claim 8 includes “a polarity-inverting type DC-DC converter.” As discussed above, Sullivan simply fails to disclose the claimed DC-DC converter. Therefore, Sullivan does not disclose all the limitations of claim 8, and Applicants respectfully submit that Sullivan does not anticipate claim 8.

Because dependent claims 3, 4, 9 and 12-16 ultimately depend from independent claims 2, 8, and 11, Applicants respectfully submit that Sullivan fails to disclose all the limitations of claims 3, 4, 9 and 12-16 for the reasons discussed above.

CONCLUSION

In view of the foregoing amendments and remarks, Applicants respectfully submit that the pending claims patentably define over the prior art. Accordingly, a Notice of Allowance is respectfully requested. In the event that the Examiner believes that the present application is not allowable for any reason, the Examiner is encouraged to contact the undersigned attorney to discuss resolution of any remaining issues.

Respectfully submitted,



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